TRIAD-DAY MOUNTAIN BRIDGE
Acadia National Park Roads & Bridges
Spanning Park Loop Road at Triad-Day Mountain Pass
Seal Harbor Vicinity
Hancock County
Maine

HAER NO. ME-46

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

PHOTOGRAPHS

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Department of the Interior
P.O. Box 37127
Washington, D.C. 20013-7127

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HISTORIC AMERICAN ENGINEERING RECORD

TRIAD-DAY MOUNTAIN BRIDGE

HAER NO. ME-46

LOCATION: Spanning Park Loop Road in Triad Pass between South Bubble Pond and Day Mountain Loop carriage road systems, between posts 17 and 37, Acadia National Park, Seal Harbor vicinity, Mount Desert Island, Hancock County, Maine

Quad: Seal Harbor, ME
UTM: 19/561010/4907010

DATE OF CONSTRUCTION: 1941

ENGINEER: Leo Grossman, Public Roads Administration, Supervising Engineer

Philip Mabel, Public Roads Administration, Structural Engineer

CONTRACTOR: W. H. Hinmam, Inc., North Anson, Maine

STRUCTURE TYPE: Stone-faced reinforced concrete rigid frame filled segmental arch bridge

FHwA STRUCTURE NO.: 1700-005S

SIGNIFICANCE: This structure provides a grade separation between the Park Loop Road and the Day Mountain Carriage Road, allowing carriage road users to cross the busy park motor road in safety. The stone-faced reinforced concrete structure is typical of bridges employed in the late 1930s extension of the Park Loop Road.

PROJECT INFORMATION: Documentation of the Triad-Day Mountain Bridge is part of the Acadia National Park Roads and Bridges Recording Project, conducted in 1994-95 by the Historic American Engineering Record.

Richard H. Quin, HAER Historian, 1994

HISTORY

This report is part of the Acadia National Park Roads and Bridges Recording Project. HAER No. ME-11, ACADIA NATIONAL PARK ROADS AND BRIDGES, contains an overview history of the park road systems. In addition, HAER No. ME-13, ROCKEFELLER CARRIAGE ROADS, and HAER No. ME-12 PARK LOOP ROAD, contain more specific information on the road systems using the structure.

History of the Triad-Day Mountain Bridge

The Triad-Day Mountain Bridge spans the Park Loop Road and provides a connection between the South Bubble Pond and Day Mountain carriage road systems. The stone-faced reinforced concrete rigid frame arch bridge was designed by the Public Roads Administration and the National Park Service, and is less rustic and more precise than the Rockefeller bridges. The bridge was the last constructed as part of the carriage road system.[1]

The Bubble Pond and Day Mountain Loop carriage roads were completed between 1930 and 1935. A few years later, when the motor road was extended through Triad Pass, the short connecting road between the Bubble Pond and Day Mountain loops had to be raised by a "grade separation structure," i.e., bridge. The new motor road section was the Day Mountain segment (Project 9A1) of the Park Loop Road. The bridge is one of four structures built in conjunction with the $223,744.17 project, which extended the loop road from Route 3 at The Black Woods to a point near Seal Harbor.[2]

Surveys for the project began in March 1937 and were carried out over the next three years. The land on which the road segment and bridge site were located belonged to John D. Rockefeller,

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[1]Vanasse Hangen Brustlin, Inc. and McGinley Hart & Associates, Historic Bridge Reconnaissance Survey, Carriage Road System, Acadia National Park, (Boston, MA: National Park Service, North Atlantic Regional Office, draft edition, September 1993), 118.

[2]William D. Rieley and Roxanne S. Brouse, *Historic Resource Study for the Carriage Road System, Acadia National Park, Mount Desert Island, Maine* (Boston, MA: National Park Service, North Atlantic Regional Office, May 1989), 228, 240; Leo Grossman, Assistant Highway Engineer, Public Roads Administration. "Final Construction Report, 1939-1941, Acadia National Park, Day Mountain Road, Hancock County, Maine" (Albany, NY: Public Roads Administration, 1941), 1-3.

Jr., who had constructed the carriage roads at his own expense, and who also provided the major funding for much of the park loop road. As was standard policy, the government did not authorize funds for the project until the right-of-way was conveyed to the park. (Rockefeller was already in the process of transferring vast amounts of his property to the National Park Service.) The route and bridge site were approved by H. J. Spelman, District Engineer for the Public Roads Administration; Thomas C. Vint, Chief of the NPS Branch of Plans and Design, and Mr. Rockefeller. Plans and specifications for the structure were prepared in the PRA district office in Washington, D.C.[3]

The $239,322.50 contract was awarded in September 1939 to W. H. Hinman, Inc., of North Anson, Maine. Construction began on 18 September with clearing for the entire project and excavation for the bridge. Hinman organized his work force into two separate crews, one to work on the highway and the other to carry out the structural work.[4] Leo Grossman was supervising engineer for the project. PRA Assistant Highway Engineer Thomas M. Lawrence was resident engineer for the highway construction, and Junior Highway Engineer Philip Mabel supervised construction of the structures.[5]

The structure was first planned with an arch radius of 27'; later, this was increased to a more gradual 64' radius. The radii of the southwest parapet flare was also increased.[6]

PRA final construction reports offer few details on the work, but construction photographs offer some information on the contractor's operations. Work began soon after the contract was awarded with excavation for the abutments and drilling for the foundations. By mid-November 1939, the contractor had completed the excavation, and hoped to pour concrete over the winter if the weather permitted.[7]

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[3]Grossman, 8-9.

[4]Ibid., 5, 15.

[5]Ibid., 16, 23.

[6]U.S. Department of the Interior, National Park Service, Branch of Plans and Design, Washington, D.C., "Carriage Road Underpass, Sta. 83+67, Proj. 9A1, Acadia National Park," construction drawing _____ (Washington, D.C.: Public Roads Administration, 16 January 1931).

[7]Grossman to John D. Rockefeller, Jr., 14 November 1939. Rockefeller Archives Center, Office of the Messrs. Rockefeller,

With the excavation complete, wooden forms were erected for the wingwall footings. The concrete for these was poured next, then the dimensioned stone facing for the abutments and wingwalls was erected. With these complete, the wooden falsework was erected to support the arch. The arch ring stones or voussoirs were then set in place, along with the formwork and the reinforcing steel for the slab deck, the voussoirs serving as the outer forms for the work. The concrete was then poured for the deck. Once it had cured, an asphalt membrane waterproofing was applied to the inner surface of the concrete before the gravel fill was placed. The fill was then compacted and the stone parapet walls were constructed. Finally, the bituminous gravel surfacing was applied.

A short section of the Day Mountain Carriage Road had to be rebuilt at the crossing site.[8] The highway segment project, including the Triad-Day Mountain Bridge, was completed on 29 May 1941 at a cost of $223,744.17, well under the authorized contract cost.[9]

In 1952, Rockefeller asked Boston architect Arthur W. McFarland, who also maintained a practice at Bar Harbor, to inspect the new bridges on the park motor roads and make suggestions for landscaping around them. McFarland reported on his recommendations, and Rockefeller forwarded these to his estate superintendent, Robert De Revere. On looking at the Triad-Day Mountain Bridge, De Revere recommended lower plantings than McFarland had suggested, using shrubs or sweet fern. Rockefeller did not think there was room for any plantings, and no work was apparently carried out.[10]

A June 1993 inspection of the bridge determined the bridge to be generally sound, though the arch was "experiencing some deterioration." Roughly 20-25 percent of the exposed concrete arch intrados had delaminated. This was likely caused by the

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Record Group 2, Homes (Seal Harbor), Box 122 Folder 72.

[8]Ibid.

[9]Grossman, 16, 23.

[10]Arthur W. McFarland, Cambridge, MA, to John D. Rockefeller, Jr., New York City, 27 October 1952; Robert De Revere, Seal Harbor, ME to Rockefeller, 1 December 1952; Rockefeller to De Revere, 8 December 1952. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group 2, Homes (Seal Harbor), Box 121 Folder 1216.

corrosion of the reinforcing steel, and/or by trapped water in the structure alternately freezing and thawing. Calcium carbonate had been deposited heavily at the voussoirs, and to a lesser degree on the intrados. Mortar joints showed some deterioration, and part of the southwest footing had been exposed by erosion. As with many of the bridges, vegetation was growing between the carriage roadway and the parapet walls.

Based on the data collected in the survey, Vanasse Hangen Brustlin, Inc., the engineering firm which conducted the inspection, recommended a rehabilitation program for the bridge which included waterproofing the roadway and directing all water away from the structure, repair of the delaminated arch intrados, repointing the mortar, removing the calcium carbonate deposits, and improved drainage at the scoured southwest wing wall.

DESCRIPTION

The structure has a total length of 74' and a clear span of 34' 8". The roadway width between parapets is 18'. It stands 20'6" above the centerline of the roadway. The park loop road passes beneath the structure in a deep cut bordered by Class A stone masonry retaining walls similar to the stone work on the faces of the bridge. The road passes beneath the structure on a superelevated curve. Exterior walls are constructed on a 1:12 batter with a parabolic camber; that is, they are wider at the abutments, tapering horizontally toward the center of the span. The stone-faced parapet walls extend 2'6" above the deck.[11]

Stone used in the masonry facing, on the parapets, and on the long retaining walls bordering the roadway cut below the bridge, is ashlar cut native pink granite. The shallow arch, constructed on a 64' radius, rises less than 2' from the springing line. Slender arch radiating voussoirs define the curve of the arch. The intrados of the arch barrel is exposed concrete. Two weepholes are located at the base of each abutment.[12]

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[11]Construction drawing _____; Vanasse Hangen Brustlin and McGinley Hart, 118.

[12]Vanasse Hangen Brustlin and McGinley Hart, 118.

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